

# THE NEW ENGINEERING

by Eugene F. Adiutori

In conventional engineering, problems are solved with the variables *combined*. This allows proportional problems to be solved in a simple and direct manner, but generally requires that nonlinear problems be solved in an indirect and unnecessarily difficult manner.

In the new engineering, problems are solved with the variables *separated*. This allows proportional problems and nonlinear problems to be solved in a simple and direct manner. The net result is that the new engineering greatly simplifies the solution of nonlinear problems.

## Conventional engineering

In conventional engineering, the primary parameters in each discipline are *combined* in ratios. The primary parameters *and* their ratio are used to describe phenomena, and to solve problems. For example,

- Electrical phenomena are described and problems are solved using electromotive force  $V$ , electric current  $I$ , and their ratio  $V/I$ . This ratio is called electrical "resistance", and is assigned the symbol  $R$ .
- Heat transfer phenomena are described and problems are solved using heat flux  $q$ , temperature difference  $\Delta T$ , and their ratio  $q/\Delta T$ . This ratio is called heat transfer "coefficient", and is assigned the symbol  $h$ .
- Stress/strain phenomena are described and problems are solved using stress  $\sigma$ , strain  $\epsilon$ , and their ratio  $\sigma/\epsilon$ . This ratio is called material "modulus" and is assigned the symbol  $E$ .

## The new engineering

In the new engineering, the primary parameters in each discipline are *not* combined in ratios. They remain *separated*. The primary parameters *without their ratio* are used to describe phenomena, and to solve problems. For example:

- Electrical phenomena are described and problems are solved using  $V$  and  $I$ . *Not used* are the ratio  $V/I$ , its symbol  $R$ , or its name "resistance".
- Heat transfer phenomena are described and problems are solved using  $q$  and  $\Delta T$ . *Not used* are the ratio  $q/\Delta T$ , its symbol  $h$ , or its name "coefficient".
- Stress/strain phenomena are described and problems are solved using  $\sigma$  and  $\epsilon$ . *Not used* are the ratio  $\sigma/\epsilon$ , its symbol  $E$ , or its name "modulus".

## The principal advantage of the new engineering

The principal advantage of the new engineering is that it simplifies the solution of nonlinear problems because the primary parameters are separated—ie they are *not* combined in ratios. The ratios, their symbols, and their names are altogether *abandoned* in the new engineering.

The simplification results because, if a problem involves nonlinear behavior, the ratio of primary parameters is variable. If this variable ratio is used in the analysis of a problem, the analysis generally must be indirect. If it is *not* used, the analysis is direct and *much* simpler.

The new engineering is easy to learn because it uses only parameters also used in conventional engineering, and because solving problems with the variables separated is the methodology learned and preferred in pure mathematics. Only in conventional engineering is it standard practice to solve problems with the variables combined.

*The New Engineering* presents the new engineering, and demonstrates its application to the solution of proportional and nonlinear problems that concern electricity, heat transfer, strength of materials, and fluid flow.

*The New Engineering* can be obtained at book stores (ask for ISBN 0-9626220-2-8), or from Ventuno Press.

Please send me a  paperback  hard cover copy of *The New Engineering* by Eugene F. Adiutori. After 30 days, I will either return it or remit \$14.95 (paperback) or \$24.95 (hard cover). (USA only)

Ventuno Press, 12887 Valewood Drive, Naples, FL 34119

Outside USA, please enclose payment with order, and add \$5 (surface mail) or \$10 (air mail).

[che.com/adlinks](http://che.com/adlinks) or circle 8